Reliability of Salivary Cortisol Measures in Dogs in a Training Context

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Salivary cortisol has been widely used as a means of assessing stress in dogs (Beerda et al 1988; Schalke et al 2007), though several authors have questioned whether handling and the use of food/chews can affect measures (Kobelt et al 2003, Dreschel and Granger 2009). We investigated effects of food on salivary cortisol measures in a handling/training context.

For the first study 10 dogs were used to investigate if food introduced unpredictable variation in salivary cortisol. For each dog tested, a control sample was taken, followed within 30 seconds by a sample with cheese (n=10), sausage (n=5) or chicken (n=5). Cortisol assayed with food tended to be lower (2.14±0.12ng/ml) than controls (2.59±0.23; $t=2.08$, $p<0.05$). This may be due to dilution of samples by greater production of fluid, or because food contamination reduces the efficacy of ELISA. There was a high positive correlation between the measures from cheese samples and their controls (Pearsons $r=0.922$, $p<0.001$), but no correlation with the sausage and chicken.

In the second study, we used cheese to encourage salivation and 10 dogs were used to investigate changes in salivary cortisol following training. Dogs responded to three common vocal commands; “come”, “stay” and “leave”, together with a fourth command of the owner’s suggestion, each given by the owner, and by a person unfamiliar to the dog. Saliva was sampled before training, then at 10, 15, 20 and 25 minutes following start of training. There was no difference in salivary cortisol measures between samples, but a high concordance across samples (Kendall’s $W=0.858$, $p<0.001$).

Our data suggests cheese does not introduce unpredictable variation in salivary cortisol measures, and consequently may be a more appropriate aid to encourage salivation than sausage, chicken or meat flavoured rope (Dreschel and Granger 2009).

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Dreschel, NA and Granger DA 2009. Hormones and Behavior, 55:163-168.
Kobelt, AJ et al 2003. Research in Veterinary Science. 75:157-161.
Schalke E et al 2007. Applied Animal Behaviour Science. 105:369-380